REMARKS

As of the filing of the present reply, claims 1-15 and 17-25 were pending in the above-identified US Patent Application.

In the Office Action, the Examiner rejected claims 1, 2, 4-11, 15, and 17-25 as anticipated by U.S. Patent No. 6,492,038 to Rigney et al. (Rigney) under 35 USC §102, rejected claims 1, 2, 4-11, 15, and 17-25 as anticipated by U.S. Patent No. 6,312,832 to Alperine et al. (Alperine) under 35 USC §102, and rejected claims 3 and 12-14 as being unpatentable under 35 USC §103. in view of Alperine and one or more of U.S. Patent No. 6,482,537 to Strangman et al. (Strangman), U.S. Patent No. 6,238,594 to Turpin et al. (Turpin), and U.S. Patent No. 6,299,971 to Maloney.

In the present reply, Applicants have canceled claims 1-10 and 21-25 (without prejudice), such that only independent claim 11 and its dependent claims 12-15 and 17-20 remain pending. Furthermore, claim 11 has been amended to correct an error, in that claim 11 recites a "carbon-containing gas" as evolving during sintering, such that the carbon-containing gas, not an "insoluble gas," is present and entrapped by the sintering process.

The above amendments do not present new matter, and the

amendments strictly comply with 37 CFR §1.116(a) as being limited to reducing and simplifying the issues remaining in the examination of Applicants' application.

Favorable reconsideration and allowance of remaining claims 12-15 and 17-20 are respectfully requested in view of the following remarks.

Rejection under 35 USC §102 based on Rigney

Independent claim 11 and its dependent claims 15 and 17-20 were rejected as anticipated by Rigney on the basis that Rigney discloses

> high-temperature evaporation of the TBC material in the presence of the carbon and/or nitrogen-containing gas(es) whereby the TBC ingot could be altered to contain carbon, a carbon-containing compound, or a carbide, or a nitride….

While correct in stating that Rigney discloses the use of carbon-containing sources to deposit a TBC, Rigney is limited to depositing carbides (and/or nitrides), and neither discloses nor suggests depositing elemental carbon in a TBC. Whether Rigney could possibly deposit elemental carbon is unknown and purely speculative, since Rigney does not disclose any conditions for evaporating an ingot that contains "carbon, a carbon-containing compound, or a carbide or nitride." Column 5, lines 56-58.

In contrast, Applicants disclose a specific process that proved the capability of depositing a dispersion of elemental carbon (graphite) in a ceramic (YSZ) coating.

Applicants therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Rigney.

Rejection under 35 USC §102 based on Alperine

Independent claim 11 and its dependent claims 15 and 17-20 were rejected as anticipated by Alperine in part on the basis that Alperine teaches

> carbon is introduced . . . to reduce the thermal conductivity of the coating (i.e. depositing elemental carbon in pores that are within grains and at and between grain boundaries . . . in an amount sufficient to thermally stabilize the microstructure of the thermal insulating material).

Actually, Alperine teaches that carbon co-deposited to "boost the nonstoichiometric crystallisation of the oxide coating" by reacting with metal oxides within the TBC, a byproduct of the reaction being carbon monoxide or carbon dioxide. Column 4, lines 6-19. Since crystallization occurs during the coating process, this reaction would appear to occur during coating deposition. Whether elemental carbon is ever present in the final TBC is not disclosed. The aging test reported by Alperine (column 5, lines 44-62) does not suggest

that elemental carbon was present in the coatings, or that carbon-containing gases evolved during aging. Therefore, though sintering may have occurred during Alperine's aging test, there is no basis to conclude that carbon-containing gases were entrapped by sintering during the aging step. Instead, CO and CO_2 appear to be trapped during the coating process. Column 4, lines 16-19.

Finally, under Section 2 on page 3 of the Office Action, the Examiner responded to Applicants' argument that "Alperine does teach a sintering operation to increase the entrapment of carbon-based gases" by stating that

> Alperine specifically teaches a barrier coating whereby carbon is **sintered** with oxides. As carbon dioxide is a well known byproduct of combustion reactions, the sintering of the carbon source will inherently produce a carbon containing gas, which will inherently entrap said gases in the barrier coating. (Original emphasis.)

The reference to "carbon [being] sintered with oxides" is based on Alperine's fabrication of rods used as the evaporation source of Alperine's coating process. Column 6, lines 15-29. Therefore, this teaching of Alperine is irrelevant to Applicants' claim of sintering a coating containing elemental carbon.

In view of the above, Applicants respectfully request withdrawal of

the rejection under 35 USC §102 based on Alperine.

Rejections under 35 USC §103 based on Alperine

In view of the above arguments concerning the §102 rejection based on Alperine, Applicants believe that the §103 rejections based on Alperine are also overcome, as none of the secondary references (Maloney, Strangman, or Turpin) disclose or suggest forming a TBC that contains elemental carbon, and then sintering the TBC to entrap the elemental carbon and/or a carbon-containing gas. Therefore, Applicants also respectfully request withdrawal of the rejections under 35 USC §103 based on Alperine.

Closing

In view of the above, Applicants believe that the claims define patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

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